IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	: Jeffrey A. Anderson	Art Unit	: 3635
Serial No.	: 10/633,694	Examiner	: Jeanette E. Chapman
Filed	: August 5, 2003		
Title	: METAL FRAMING MEMBER AND METHOD OF MANUFACTURE		

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BRIEF ON APPEAL UNDER 37 C.F.R § 1.192

Appellants are appealing the rejection of claims 1-30, 32-34, 36-44, 49-51 and 53-58 from the action dated April 2, 2008. A Notice of Appeal is being filed concurrently. Appellants request that the rejection of these claims be reversed.

(i) Real Party in Interest

The real party of interest is Jeffrey A. Anderson. This application has not been assigned to any other entity.

(ii) Related Appeals and Interferences

There are no related appeals or interferences.

(iii) Status of Claims

Claims 1-30, 32-34, 36-44, 49-51 and 53-58 are pending and are being appealed. Claims 1, 27, 42, 53 and 54 are in independent form.

(iv) Status of Amendments

No amendments were made to the claims subsequent to the amendments filed on November 9, 2006.

(v) Summary of Claimed Subject Matter

Claim 1 relates to a metal framing member including a formed metal sheet having a length and including a web region including a plurality of expanded web slots including voids and metal web elements and extending along a portion of the length, wherein the region includes a plurality of reinforcements proximate to the web slots and confined to the web elements and exclusive to the web voids. See p. 2, lines 3-5 and p. 4, lines 15-16 of the specification. Each expanded web slot has a length to width ratio of 2:1 or greater. See **Figure 1** of the specification. The ratio of the distance between adjacent slots prior to expansion to a width of the formed metal sheet prior to expansion is 1:8 or greater. See Figures 1 and 6 of the specification.

Claim 27 relates to a method of manufacturing a framing member including providing a formed metal sheet having a length and a web region; placing a plurality of slots along a portion of the length in the web region such that the ratio of the distance between adjacent slots prior to expansion to a width of the formed metal sheet prior to expansion is 1:8 or greater; placing reinforcements proximate to the slots confined to the web elements and exclusive to the web voids; and expanding the slots of the web region to form expanded slots having a web element and a web void. See p. 2, line 26 to p. 3, line 3 and Figures 1 and 6 of the specification. Each expanded web slot having a length to width ratio of about 2:1 or greater. See Figures 1 and 6 of the specification.

Claim 42 relates to a method of building a structure comprising: placing an expanded framing member in a portion of the structure, the expanded framing structure including a plurality of expanded web slots forming a plurality of web elements and a plurality of voids in a region of the framing member, wherein the region includes a plurality of reinforcements proximate to the web slots and confined to the web elements and exclusive to the web voids. See p. 3, lines 7-16 of the specification. Each expanded web slot has a length to width ratio of 2:1 or greater. See **Figure 1** of the specification. The ratio of the distance between adjacent slots prior to expansion to a width of the formed metal sheet prior to expansion is 1:8 or greater. See Figures 1 and 6 of the specification.

Claim 53 relates to a method of manufacturing a framing member comprising: providing a formed metal sheet having a length and a web region; placing a plurality of slots along a

portion of the length in the web region such that the ratio of the distance between adjacent slots prior to expansion to a width of the formed metal sheet prior to expansion is 1:8 or greater (see Figures 1 and 6 of the specification); expanding the slots of the web region to form expanded slots having a web element and a web void, each expanded web slot having a length to width ratio of about 2:1 or greater and heat treating the member. See p. 2, line 26 to p. 3, line 6 and Figure 1 of the specification.

Claim 54 relates to a metal framing member comprising: a formed metal sheet including a plurality of expanded web slots in a region of the formed metal sheet, wherein the expanded web slots are heat treated, each expanded web slot having a length to width ratio of 2:1 or greater. See p. 2, line 26 to p. 3, line 6 and Figures 1 and 6 of the specification. The ratio of the distance between adjacent slots prior to expansion to a width of the formed metal sheet prior to expansion is 1:8 or greater. See Figures 1 and 6 of the specification.

(vi) Grounds of Rejection to be Reviewed on Appeal

1. Whether claims 1, 3-15, 27-30, 32-34, 36-44, 49-51 and 53-58 are unpatentable under 35 U.S.C. § 112, first paragraph.
2. Whether claims 1, 3-15, 17-30, 32-51 and 53-59 are unpatentable under 35 U.S.C. §103(a) as being obvious over German Patent No. 3,336,378 to Knauf in view of U.S. Patent No. 5,605,024 to Sucato et al., U.S. Patent No. 5,913,788 to Herren, and U.S. Patent No. 5,527,625 to Bodnar.

(vii) Arguments

1. Whether claims 1, 3-15, 27-30, 32-34, 36-44, 49-51 and 53-58 are unpatentable under 35 U.S.C. § 112, first paragraph

The Examiner has maintained the rejection of claims 1, 3-15, 27-30, 32-34, 36-44, 49-51 and 53-58 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. See Office Action at p. 2. Claims 1, 27, 42, 53 and 54 are independent claims. The Examiner maintains that the phrase "the ratio of the distance between adjacent slots prior to expansion to a width of the formed metal sheet prior to expansion is 1:8 or greater" is not supported by the specification. See Office Action at p. 2.

MPEP 2163.02 states that "The subject matter of the claim need not be described literally in order for the disclosure to satisfy the description requirement." Rather, it is sufficient if the "description clearly allow persons of ordinary skill in the art to recognize that he or she invented what is claimed." Id. MPEP 2163.02 further states that

> [u]nder *Vas-Cath, Inc. v. Mahurkar*, 935 F.2d 1555, 1563-64, 19 USPQ2d 1111, 1117 (Fed. Cir. 1991), to satisfy the written description requirement, an applicant must convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession of the invention, and that the invention, in that context, is whatever is now claimed. The test for sufficiency of support in a parent application is whether the disclosure of the application relied upon "reasonably conveys to the artisan that the inventor had possession at that time of the later claimed subject matter." *Ralston Purina Co. v. Far-Mar-Co., Inc.*, 772 F.2d 1570, 1575, 227 USPQ 177, 179 (Fed. Cir. 1985) (quoting *In re Kaslow*, 707 F.2d 1366, 1375, 217 USPQ 1089, 1096 (Fed. Cir. 1983)).

The phrase "the ratio of the distance between adjacent slots prior to expansion to a width of the formed metal sheet prior to expansion is 1:8 or greater" is supported by Figures 1 and 6 of the specification. For example, Figure 6 of the specification illustrates that "the ratio of the distance between adjacent slots prior to expansion to a width of the formed metal sheet prior to expansion is 1:8 or greater." When measured directly from Figure 6, the distance between adjacent slots prior to expansion is $1/8^{th}$ of an inch whereas the width of the formed sheet prior to expansion is an inch. See Figure 6 of the specification.

Accordingly, the specification sufficiently describes the claimed invention in full, clear, concise and exact terms. Appellant respectfully requests reconsideration and withdrawal of this rejection.

2. Whether claims 1, 3-15, 17-30, 32-51 and 53-59 are unpatentable under 35 U.S.C. §103(a) as being obvious over German Patent No. 3,336,378 to Knauf in view of U.S. Patent No. 5,605,024 to Sucato et al., U.S. Patent No. 5,913,788 to Herren, and U.S. Patent No. 5,527,625 to Bodnar.

The Examiner has maintained the rejection of claims 1, 3-15, 17-30, 32-51 and 53-59 under 35 U.S.C. §103(a) as being unpatentable over German Patent No. 3,336,378 to Knauf ("Knauf") in view of U.S. Patent No. 5,605,024 to Sucato et al. ("Sucato"), U.S. Patent No.

5,913,788 to Herren ("Herren"), and U.S. Patent No. 5,527,625 to Bodnar ("Bodnar"). See Office Action at pages 2-10. Claims 1, 27, 42, 53 and 54 are independent.

Claims 1, 27 and 42

Appellant has discovered a metal framing including a web region including a plurality of reinforcements proximate to the web slots and confined to the web elements and exclusive to the web voids, each expanded web slot has a length to width ratio of about 2:1 or greater, and the ratio of the distance between adjacent slots prior to expansion to a width of the formed metal sheet prior to expansion is 1:8 or greater. See claims 1, 27, and 42.

The Examiner refers to Knauf and Sucato and contends that "it is within the scope of both references to expand the web of the stud to the required dimensions for any particular constructions project for which the stud is incorporated." See Office Action at p. 7. Knauf shows a framing member having a much smaller ratio of web element width to **unexpanded** framing member width. See Fig. 1 of Knauf. Knauf does not teach or suggest a framing member in which the ratio of the distance between adjacent slots prior to expansion to a width of the formed metal sheet prior to expansion is 1:8 or greater. This defect is not remedied in Sucato. Sucato discloses "a pair of U-shaped members 62 and 63 which may be formed of a metallic material that are interconnected by bight 64 comprising an expandable mesh 65" (col. 4, lines 22-25 of Sucato), and shows a framing member having a much smaller ratio of web element width to unexpanded framing member width than recited in claims 1, 27, and 42. See Figs. 20-21 of Sucato.

These defects are not remedied in Herren and Bodnar either. Each of these references fails to teach or suggest a framing member in which the ratio of the distance between adjacent slots **prior to expansion** to a width of the formed metal sheet **prior to expansion** is 1:8 or greater.

There is no motivation or suggestion within the references to combine Knauf with Sucato, Herren, or Bodnar. The references, alone and in combination, fail to teach the claimed ratio of web element width to unexpanded framing member width.

Accordingly, claims 1, 27, and 42, and claims that depend therefrom are patentable over the combination of Sucato, Bodnar and Herren for at least the reasons discussed above. Appellant requests that this rejection be reconsidered and withdrawn.

Claim 53

As previously explained, none of the references teaches or suggests that the ratio of the distance between adjacent slots prior to expansion to a width of the formed metal sheet prior to expansion is 1:8 or greater.

None of Knauf, Sucato, or Herren, alone or in combination, teach or suggest heat treating expanded web slots in a formed metal sheet. The Examiner incorrectly asserts that Bodnar teaches this element, referring to column 7, line 50 - column 8, line 65. See Office Action at p. . Bodnar actually discloses that the described member **can be formed from cold rolled or hot rolled steel**. See column 2, lines 41-42 of Bodnar. Bodnar does not teach or suggest expanding the slots of the web region to form expanded slots having a web element and a web void, and heat treating the member after expanding the slots. Bodnar merely describes piercing cold rolled or hot rolled steel. MPEP 2145, paragraph X(A), states that "[a]ny judgment on obviousness is in a sense necessarily a reconstruction based on hindsight reasoning, but so long as it takes into account only knowledge which was within the level of ordinary skill in that art at the time the claimed invention was made and **does not include knowledge gleaned only from applicant's disclosure,** such a reconstruction is proper" (emphasis added by Appellant) (citing In *re McLaughlin* 443 F.2d 1392, 1395 (CCPA 1971)). The Examiner's obviousness rejection of the claims violates the basic considerations of obviousness as set forth in MPEP 2141 ("[t]he references must be viewed without the benefit of impermissible hindsight vision afforded by the claimed invention.").

Additionally, as previously explained, there is no motivation or suggestion to combine the teachings of Knauf, Sucato, Herren, and Bodnar. For at least these reasons, claim 53 should be allowed. Appellant respectfully requests that this rejection be reconsidered and withdrawn.

Claim 54

Claim 54, which recites a metal framing member having expanded web slots that are heat treated, also stands rejected as being obvious over Knauf in view of Sucato, Herren, and Bodnar. As previously explained, Knauf, Sucato, Herren, and Bodnar do not disclose expanded web slots that have been heat treated. Further as previously discussed, these references also fail to teach or

suggest that the ratio of the distance between adjacent slots prior to expansion to a width of the formed metal sheet prior to expansion is 1:8 or greater, or that the framing member includes a plurality of reinforcements proximate to the web slots and confined to the web elements and exclusive to the web voids.

Additionally, as noted, there is no motivation or suggestion to combine the teachings of Knauf, Sucato, Herren, and Bodnar. For at least these reasons, claim 54 should be allowed. Appellant respectfully requests that this rejection be reconsidered and withdrawn.

Evidence of Non-Obviousness

MPEP 2141 states that the "Office policy is to follow *Graham v. John Deere Co.* in the consideration and determination of obviousness under 35 U.S.C. 103." MPEP 2141 further states that "[a]s quoted above, the four factual inquires enunciated therein as a background for determining obviousness are as follows: (A) Determining the scope and contents of the prior art; (B) Ascertaining the differences between the prior art and the claims in issue; (C) Resolving the level of ordinary skill in the pertinent art; and (D) Evaluating evidence of secondary considerations."

Appellant respectfully requests the consideration of two Declarations under 37 C.F.R. § 1.132 from Roger A. LaBoube ("LaBoube declaration," attached at Appendix A) and Francis J. Roost ("Roost declaration," attached at Appendix B), previously filed on September 8, 2007, as evidence of secondary consideration in the determination of obviousness under 35 U.S.C. § 103.

Professor LaBoube is a Professor in the Department of Civil Engineering at the University of Missouri-Rolla. Professor LaBoube has reviewed the metal framing member concept and has concluded the following:

> This concept is innovative in that it incorporates the structural features required of a wall stud application. Importantly the metal framing member design concept incorporates a highly efficient use of materials, thus the high strength to weight ratio should be realized.
>
> In addition to providing an efficient load bearing wall stud, the web profile should realize significant energy efficiency. Further, the use of galvanized sheet steel is an appropriate material selection. The sheet steel provides excellent strength and the galvanized coating will ensure long term durability.

See the LaBoube declaration.

Mr. Roost is a retired (unlicensed) Certified Public Accountant (CPA) who was asked to comment on the potential commercial value of the design as presented in U.S. Application Serial No. 10/633,694. Mr. Roost has concluded the following:

> First, based on a 2002 study (best available) for non residential construction, interior walls, published by the Steel Framing Alliance, there are 2.8 billion lineal feet of product made annually, that could be affected. A copy of the study is attached as Exhibit A. See page 13. The Reported Tonnage of product ha[s] been converted to lineal feet in exhibit B.
>
> Second, the design concept described in the above-mentioned provisional and utility applications reduces usage of material by 37% as compared to the existing commercial product. Current interior wall technology uses 0.331 lb/ft versus 0.209 lb/ft with this new concept. The savings which result is 0.122 lb/ft. A copy of the calculations is Exhibit C.
>
> Third, according to the 9/6/2007 edition of the American Metal Market, pricing on Galvanized Steel used to make this product is currently is $39.00 per hundredweight or $0.39/lb., A copy of the pricing is attached as Exhibit D.
>
> If this design was incorporated into 100% of the available market, the annual market value through material savings alone would be $133,000,000.00. Calculations are Exhibit E. These calculations do not include Exterior walls, Floors and Roofs, which per the inventor, are also potential uses of this patent [application].

See the Roost declaration.

As such, substantial evidence of non-obviousness exists relating to commercial success and unexpected advantages of Appellant's invention. Appellant respectfully requests reconsideration and withdrawal of this rejection.

CONCLUSION

The rejection of all claims should be reversed for the reasons given above. The Commissioner is authorized to charge $255 to the Deposit Account 19-4293 for the appeal brief fee. Should any further fees be required, please charge Deposit Account **19-4293**.

Respectfully submitted,

Date: 6-30-08

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(viii) Claims Appendix

1. A metal framing member comprising: a formed metal sheet having a length and including a web region including a plurality of expanded web slots including voids and metal web elements and extending along a portion of the length, wherein the region includes a plurality of reinforcements proximate to the web slots and confined to the web elements and exclusive to the web voids, each expanded web slot has a length to width ratio of 2:1 or greater, and the ratio of the distance between adjacent slots prior to expansion to a width of the formed metal sheet prior to expansion is 1:8 or greater.

2. (Canceled)

3. The member of claim 1, wherein the formed metal sheet includes a web region and a first flange extending from the web region.

4. The member of claim 3, wherein the formed metal sheet further includes a second flange extending from the web region in a direction substantially parallel to the first flange.

5. The member of claim 3, wherein the web region includes the expanded web slots.

6. The member of claim 3, wherein the first flange includes the expanded web slots.

7. The member of claim 3, wherein each of the web region and the first flange includes the expanded web slots.

8. The member of claim 5, wherein each of the web region, the first flange and the second flange includes the expanded web slots.

9. The member of claim 4, wherein the formed metal sheet further includes a closing region extending the first flange to the second flange to form a substantially tubular structure.

10. The member of claim 9, wherein each of the web region, the first flange, the second flange and the closing region includes the expanded web slots.

11. The member of claim 1, wherein each web slot extends along a portion of a length of the member.

12. The member of claim 1, wherein the plurality of web slots is arranged in offset columns substantially parallel to a length of the member.

13. The member of claim 1, wherein the plurality of web slots form three or more columns of slots along the length of the member.

14. The member of claim 13, wherein the plurality of web slots form five or more columns of slots along the length of the member.

15. The member of claim 1, further comprising additional reinforcements in the web elements.

16-26. (Canceled)

27. A method of manufacturing a framing member comprising: providing a formed metal sheet having a length and a web region; placing a plurality of slots along a portion of the length in the web region such that the ratio of the distance between adjacent slots prior to expansion to a width of the formed metal sheet prior to expansion is 1:8 or greater; placing reinforcements proximate to the slots confined to the web elements and exclusive to the web voids; and expanding the slots of the web region to form expanded slots having a web element and a web void, each expanded web slot having a length to width ratio of about 2:1 or greater.

28. The method of claim 27, wherein providing the formed metal sheet includes roll forming a metal sheet.

29. The method of claim 27, wherein placing the plurality of slots includes piercing slots into the region.

30. The method of claim 27, wherein placing the plurality of slots includes stamping the slots into the region.

31. (Canceled)

32. The method of claim 27, wherein expanding the slots includes passing the formed metal sheet over a tapered block.

33. The method of claim 27, wherein expanding the slots includes mechanically moving sides of the region apart.

34. The method of claim 27, wherein the reinforcements are placed proximate to the slots before expanding the slots.

35. (Canceled)

36. The method of claim 27, wherein the formed metal sheet includes a first flange extending from the web region and a second flange extending from the web region in a direction substantially parallel to the first flange.

37. The method of claim 27, further comprising placing a plurality of slots along a portion of the length in each of the first flange and the second flange.

38. The method of claim 37, further comprising expanding the slots of the first flange and the second flange.

39. The method of claim 36, wherein the formed metal sheet further includes a closing region extending the first flange to the second flange to form a substantially tubular structure.

40. The method of claim 27, wherein placing the plurality of slots includes arranging the slots in offset columns substantially parallel to a length of the member.

41. The method of claim 27, further comprising heat treating the member after expanding the slots.

42. A method of building a structure comprising: placing an expanded framing member in a portion of the structure, the expanded framing structure including a

plurality of expanded web slots forming a plurality of web elements and a plurality of voids in a region of the framing member, wherein the region includes a plurality of reinforcements proximate to the web slots and confined to the web elements and exclusive to the web voids, and each expanded web slot has a length to width ratio of 2:1 or greater and the ratio of the distance between adjacent slots prior to expansion to a width of the formed metal sheet prior to expansion is 1:8 or greater.

43. The method of claim 42, further comprising installing wiring, plumbing or a heating duct through at least one void of the member.

44. The member of claim 1, wherein the reinforcements include a strengthening flange.

45-48. (Canceled)

49. The method of claim 27, wherein the reinforcements are placed proximate to the slots after expanding the slots.

50. The method of claim 27, wherein the reinforcements include a strengthening flange.

51. The method of claim 42, wherein the reinforcements include a strengthening flange.

52. (Canceled)

53. A method of manufacturing a framing member comprising: providing a formed metal sheet having a length and a web region; placing a plurality of slots along a portion of the length in the web region such that the ratio of the distance between adjacent slots prior to expansion to a width of the formed metal sheet prior to expansion is 1:8 or greater; expanding the slots of the web region to form expanded slots having a web element and a web void, each expanded web slot having a length to width ratio of about 2:1 or greater; and heat treating the member.

54. A metal framing member comprising: a formed metal sheet including a plurality of expanded web slots in a region of the formed metal sheet, wherein the expanded web slots are heat treated, each expanded web slot having a length to width ratio of 2:1 or greater, and the ratio of the distance between adjacent slots prior to expansion to a width of the formed metal sheet prior to expansion is 1:8 or greater.

55. The member of claim 1, wherein the reinforcements include a dart or dimple.

56. The method of claim 27, wherein the reinforcements include a dart or dimple.

57. The method of claim 42, wherein the reinforcements include a dart or dimple.

58. The method of claim 27, wherein the reinforcements are placed prior to placing the slot.

59. (Canceled)

(ix) Evidence Appendix

A copy of the declaration under 37 CFR § 1.132 from Roger A. LaBoube filed on September 8, 2007 and relied upon by Appellant in the appeal is attached.

A copy of the declaration under 37 CFR § 1.132 from Francis J. Roost filed on September 8, 2007 and relied upon by Appellant in the appeal is attached.

(x) Related proceedings Appendix

None.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Jeffrey A. Anderson — Art Unit : 3635
Serial No. : 10/633,694 — Examiner : Jeanette E. Chapman
Filed : August 5, 2003
Title : METAL FRAMING MEMBER AND METHOD OF MANUFACTURE

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

DECLARATION OF ROGER A. LABOUBE UNDER 37 C.F.R. §1.132

I, Roger A. LaBoube, declare:

1. I am a Professor in the Department of Civil Engineering at the University of Missouri-Rolla. I have a BS, MS and PhD in Civil Engineering. I have been professionally involved with the cold-formed steel industry for over 25 years. I have authored multiple publications that serve to support the development of industry design standards for the application of cold-formed steel products in Commercial and Residential Buildings.

2. I have reviewed the metal framing member concept as presented in Provisional Application No. 60/588,798 filed on July 19, 2004 and as presented in U.S. Application Serial No. 10/633,694, also published as US 2004-0093822 A1, which claims priority to that provisional application.

3. I have reviewed the metal framing member concept to be used in wall stud applications. This concept is innovative in that it incorporates the structural features required of a wall stud application. Importantly the metal framing member design concept incorporates a highly efficient use of materials, thus the high strength to weight ratio should be realized.

4. In addition to providing an efficient load bearing wall stud, the web profile should realize significant energy efficiency. Further, the use of galvanized sheet steel is

an appropriate material selection. The sheet steel provides excellent strength and the galvanized coating will ensure long term durability.

5. All statements made herein of my knowledge are true and that all statements made on information and belief are believed to be true; and further these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patents issued thereon.

Date: 9/25/07

Roger A. LaBoube

Roger A. LaBoube

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Jeffrey A. Anderson
Serial No. : 10/633,694
Filed : August 5, 2003
Title : METAL FRAMING MEMBER AND METHOD OF MANUFACTURE

Art Unit : 3635
Examiner : Jeanette E. Chapman

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

DECLARATION OF FRANCIS J. ROOST UNDER 37 C.F.R. §1.132

I, Francis J. Roost declare:

1. I am a retired (unlicensed) Certified Public Accountant (CPA). I have been asked to comment on the potential commercial value of the design as presented by the Provisional Application No. 60/588,798 filed on July 19, 2004 which is also presented in U.S. Application Serial No. 10/633,694, also published as US 2004-0093822 A1, which claims priority to that provisional application.

2. First, based on a 2002 study (best available) for non residential construction, interior walls, published by the Steel Framing Alliance, there are 2.8 billion lineal feet of product made annually, that could be affected. A copy of the study is attached as Exhibit A. See page 13. The Reported Tonnage of product have been converted to lineal feet in exhibit B.

Second, the design concept described in the above-mentioned provisional and utility applications reduces usage of material by 37% as compared to the existing commercial product. Current interior wall technology uses 0.331 lb/ft versus 0.209 lb/ft with this new concept. The savings which result is 0.122 lb/ft. A copy of the calculations is Exhibit C

Third, according to the 9/6/2007 edition of the American Metal Market, pricing on Galvanized Steel used to make this product is currently is $39.00 per hundredweight or $0.39/lb.. A copy of the pricing is attached as Exhibit D.

3. If this design was incorporated into 100% of the available market, the annual market value through material savings alone would be $133,000,000.00. Calculations are Exhibit E. These calculations do not include Exterior walls, Floors and Roofs, which per the inventor, are also potential uses of this patent

4. All statements made herein of my knowledge are true and that all statements made on information and belief are believed to be true; and further these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patents issued thereon.

Date: Sept 15, 2004

Francis J. Roost

EXHIBIT A

DATA AND STATISTICAL ANALYSIS OF THE

USE OF COLD FORMED STEEL IN

NONRESIDENTIAL CONSTRUCTION

Steel Framing Alliance®

Steel. The Better Builder.

EXHIBIT A

Introduction

Steel framing, a concept introduced in the 1920s and 1930s, in now a common sight in commercial, institutional, and industrial projects around the world. A variety of factors in the market place, including heightened requirements for non-combustible assemblies, environmental advantages, and design flexibility, promise to increase the specification and use of steel framing. This growth is destined to continue as other critical elements fall into place, including the establishment and proliferation of codes and standards, introduction of new tools and construction techniques, maturation of the truss and components industry, and an expanding ranks of knowledgeable and experienced framers and engineers.

As the use of steel framing has grown, so has the need to assess where that growth is taking place so that manufacturers, suppliers, and builders can better align themselves to meet current needs. The purpose of this study was to develop a statistical analysis of the nonresidential steel framing market and the industry's current participation in a broad spectrum of applications and categories of structures. Through this report, it is our intention that the user will gain a better, more precise understanding of where steel framing currently enjoys significant market share, and where there are opportunities for growth.

Collection of Data

This report was developed by a team of individuals representing a broad range of disciplines within the steel framing industry, including builders, component and panel fabricators, steel producers, and stud manufacturers. Data was collected from a variety of sources, including F.W. Dodge, R.S. Means, the Steel Stud Manufacturers Association, (SSMA), and FMI.

The data from F.W. Dodge provided the number of units and total square footage constructed for various nonresidential market segments, which included Stores and Food Service, Warehouses, Office and Bank Buildings, Hotels & Motels, Garages & Service Stations, Manufacturing Plants, Laboratories, Schools & Colleges, Libraries & Museums, Dormitories, Hospital & Health Treatment, Public Buildings, Religious, Amusement, Apartments/Assisted Living, and Miscellaneous. The data from R.S. Means provided typical building characteristics for each market segment, which included the number of stories, wall height and gross floor area. Additional characteristics for the representative buildings were derived, including the footprint area, length and width.

For each component (i.e., exterior walls, interior walls, floors and roofs) and for each representative building, typical framing designs were established and material intensities (lbs/sf) determined. These material intensities were multiplied by the square footage of construction from F.W. Dodge to compute the market opportunity (tons) for each market segment.

Overall market share was computed by dividing industry shipments (tons) by the market opportunity. Industry shipments were as reported by SSMA with an adjustment for estimated non-SSMA member shipments. Market share for interior walls was determined by considering only the industry shipments of 18, 27 and 30-mil thickness material. Market share for exterior walls was determined from an extensive survey that had been conducted in 1997 by FMI for the American Iron & Steel Institute (AISI). Market share for floor and roof framing represented the balance of industry shipments, excluding walls, divided by the market opportunity for these components.

Total Market Opportunity

In defining the potential market demand for cold-formed steel framing, the entire area within a structure where framing members could be used was totaled and translated into tons using the method as described above. Not included in this calculation were areas within specific types of structures that typically would not be available to steel framing. For example, only elevated floor area was considered in determining the floor framing opportunity, as it is not envisioned that cold-formed steel would replace slab-on-grade construction.

If steel framing were used in all the available nonresidential applications, it would require shipments of 4,464,258 tons per year. By far, the largest segment would be Apartment/ Assisted Living at 1,055,193 tons as these are typically multi-story structures with many interior walls, and large roof systems. Warehouses, Stores/Food Service, Office/Bank Buildings, and Schools/Colleges would also consume significant volumes of steel studs.

Roofs are the area within the structure where there is the greatest potential demand for steel studs at 1,432,569 tons per year. The Warehouses segment represents the largest possible demand at 317,635 tons per year, followed by Stores/Foodservice at 207,406 tons per year.

The second largest potential application for steel framing is Exterior Walls at 1,267,953 tons per year. Apartments/Assisted Living category represents the largest possible demand at 185,350 tons per year. Other Dodge categories with the largest potential demand include Stores/Food Service, Warehouses, and Garages/Service Stations that typically are designed as large perimeters with few interior partitions.

At 1,224,291 tons per year, the Interior Walls segment represents nearly as much potential as Exterior Walls. Again, the Apartments/Assisted Living category is the largest by far at 495,385 tons per year. Office/Bank Buildings, another category typified by many interior spaces, is second largest at 228,205 tons per year.

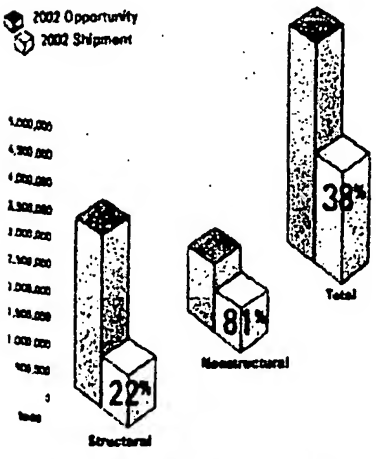
Not surprisingly, Floors is the nonresidential segment with the smallest potential demand for steel framing materials at 540,445 tons per year. This relatively small potential is due to the fact that nearly half of Dodge structural categories typically utilize slab-on-grade construction.

Current Market Share

The estimated size of the current (2002) market for nonresidential steel framing is determined by applying a rationalized percentage (see section I.) to the total market opportunity described (Section II).

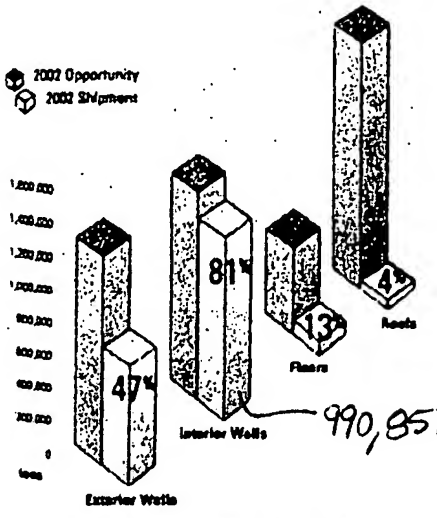
Using this method, the total amount of steel framing shipped to all nonresidential segments was 1,716,911 tons in 2002. Of the four main applications, it is not surprising that Interior Walls represents the largest single destination for steel studs at 990,857 tons in 2002. This is estimated to represent 81.4 percent share of the available market. Using the FMI study (Section I), Exterior Walls had obtained 47 percent share of the available market. Floors and Roofs are shown to have captured a very small portion of the available market at 13 percent and 4 percent, respectively.

Market Share by Product - 2002



Nonresidential Steel Framing Market

Market Share by Application - 2002



Nonresidential Steel Framing Market

Segments of Opportunity

This study provides the reader with a starting point for developing a better understanding of "opportunity", which could be defined as the difference between actual and potential participation.

A partial analysis might show the following:

Warehouses

Total Opportunity	517,565 tons
Current Participation	97,933 tons
	419,632 tons Opportunity for Growth

Schools / Colleges

Total Opportunity	465,826 tons
Current Participation	120,383 tons
	345,443 tons Opportunity for Growth

Dormitories

Total Opportunity	61,786 tons
Current Participation	30,272 tons
	31,514 tons Opportunity for Growth

Other considerations could also include those factors that may weigh in favor of the use of steel framing, such as increasing requirements for non-combustible construction, and economic conditions that may stimulate or restrain types of structures within the nonresidential construction industry. Those considerations are beyond the scope of this document.

Market Data and Building Characteristics

		FWDodge Market Data			Typical Building Characteristics per RS Means						
	Dodge Segment	Means Class	1,000 SF	No. of Units	Avg. SF	Stories	Wall Height	Gross SF	Footprint	Width	Length	LF Wall
1	Stores and Food Service	Restaurant, Fast Food				1	10	4000	4000	53	75	257
	Store, Convenience					1	12	4000	4000	53	75	257
	Average		252,865	20,449	12,366	1	11	4000	4000	53	75	257
2	Warehouses	Warehouse	195,819	6,617	29,593	1	24	30000	30000	145	206	703
3	Office and Bank Buildings	Office, 2-4 Story				3	12	20000	6667	69	97	995
	Bank					1	14	4100	4100	54	76	260
	Average		150,458	23,100	6,513	2	13	12050	5383	61	87	627
4	Hotels & Motels	Motel, 2-3 Story	39,396	1,121	35,144	3	9	49000	16333	107	152	1557
5	Garages & Service Stations	Garage, Repair				1	14	10000	10000	84	119	406
	Garage, Service Station					1	12	1400	1400	31	45	152
	Average		156,915	4,887	32,109	1	13	5700	5700	58	82	279
6	Manufacturing Plants	Factory	52,180	1,972	26,460	1	20	30000	30000	145	206	703
7	Laboratories	Medical Office, 1 Story	16,061	728	22,062	1	10	7000	7000	70	100	340
8	Schools & Colleges	School, Jr. High	227,850	11,757	19,380	2	12	110000	55000	197	279	1905
9	Libraries & Museums	Library	12,881	1,182	10,898	2	14	22000	11000	88	125	852
10	Dormitories	Apartment, 1-3 Story	23,071	721	31,999	3	10	22500	7500	73	103	1055
11	Hospital & Health Treatment	Medical Office, 2 Story	96,558	7,480	12,909	2	10	7000	3500	50	70	480
12	Public Buildings	Town Hall, 2-3 Story	36,561	2,627	13,917	3	12	18000	6000	65	92	944
13	Religious	Church	51,146	4,543	11,258	1	24	17000	17000	110	155	529
14	Amusement	Movie Theatre	70,052	6,905	10,145	1	20	12000	12000	92	130	445
15	Apartments/Assisted Living	Apartment, 1-3 Story	394,011	29,401	13,401	3	10	22500	7500	73	103	1055
16	Misc.	Average	24,627	1,870	13,170	2	14	24583	13657	98	139	949
	Totals		1,800,451	125,360	14,362							

Assumptions
- Means building models are similar to Dodge classifications.
- Widths and lengths are assumed values based on rectangular shaped buildings.
- LF of Wall is building perimeter

Exterior Walls

Tons of steel in each Dodge Classification based on 100% steel exterior walls

	Dodge Segment	Means Class	Stories	Wall Height	LF Wall	Steel in Wall				
						350S162-43	600S162-43	800S162-54	Total (LBS)	Total (Tons)
1	Stores and Food Service	Restaurant, Fast Food	1	10	257	5,153	0	0		
		Store, Convenience	1	12	257	6,184	0	0		
	Average		1	11	257	5,668	0	0	5,668	2.83
2	Warehouses	Warehouse	1	24	703	0	0	56,153	56,153	28.08
3	Office and Bank Buildings	Office, 2-4 Story	3	12	995	0	31,933	0		
		Bank	1	14	260	0	0	12,109		
	Average		2	13	627	0	15,967	6,055	22,021	11.01
4	Hotels & Motels	Motel, 2-3 Story	3	9	1,557	0	37,487	0	37,487	18.74
5	Garages & Service Stations	Garage, Repair	1	14	406	0	0	18,912		
		Garage, Service Station	1	12	152	0	4,878	0		
	Average		1	13	279	0	2,439	9,456	11,895	5.95
6	Manufacturing Plants	Factory	1	20	703	0	0	46,794	46,794	23.40
7	Laboratories	Medical Office, 1 Story	1	10	340	6,817	0	0	6,817	3.41
8	Schools & Colleges	School, Jr. High	2	12	1,905	0	61,147	0	61,147	30.57
9	Libraries & Museums	Library	2	14	852	0	0	39,670	39,670	19.83
10	Dormitories	Apartment, 1-3 Story	3	10	1,055	21,169	0	0	21,169	10.58
11	Hospital & Health Treatment	Medical Office, 2 Story	2	10	480	9,641	0	0	9,641	4.82
12	Public Buildings	Town Hall, 2-3 Story	3	12	944	0	30,294	0	30,294	15.15
13	Religious	Church	1	24	529	0	0	42,271	42,271	21.14
14	Amusement	Movie Theatre	1	20	445	0	0	29,595	29,595	14.80
15	Apartments/Assisted Living	Apartment, 1-3 Story	3	10	1,055	21,169	0	0	21,169	10.58
16	Misc.	Average	2	14	949	0	0	44,623	44,623	22.31

Stud properties	Weight LB/LF
350S162-43	1.14
600S162-43	1.52
600S162-54	1.89

Wall properties	Weight of Wall Section (LBS)	Unit Wt (LB/LF/FT HT)
350S162-43	100.32	2.01
600S162-43	133.76	2.68
600S162-54	166.32	3.33

Unit weight (1' high, 1' long) is based on calculations using a section 8' height, 10' long, 16" o.c.

1.6 = the weight amplification factor to account for door/window openings, bracing, waste etc. included in the above calculation.

Assumptions

- Means commercial construction examples are typical of Dodge classifications
- All exterior walls are steel framed
- Three size studs are used to approximate tons of steel.
- LF of wall is used to determine amount of steel in example.
- 350S162-43 studs are used in walls 12 feet high or less
- 600S162-43 studs are used for walls between 12 and 14 feet in height except for hotels and motels
- 600S162-54 studs are used for walls over 14 feet high

Interior Walls

Tons of steel in each Dodge Classification based on 100% steel interior walls

Dodge Segment	Means Class	Stories	Wall Height	LF Wall	% Interior	LF Int. Wall	Steel in Wall: 350S125-30	350S125-33	350S162-33	Total (LBS)	Total (Tons)
1 Stores and Food Service	Restaurant, Fast Food	1	10	257	40	103	918				
	Store, Convenience	1	12	257	40	103	1,102				
Average		1	11	257	40	103	1,010			1,010	0.51
2 Warehouses	Warehouse	1	24	703	25	176			5,107	5,107	2.55
3 Office and Bank Buildings	Office, 2-4 Story	3	12	995	600	5,968		70,904	0		
	Bank	1	14	260	50	130		0	2,202		
Average		2	13	627	325	2,039		35,452	1,101	36,556	18.28
4 Hotels & Motels	Motel, 2-3 Story	3	9	1,557	600	9,342		83,237		83,237	41.62
5 Garages & Service Stations	Garage, Repair	1	14	406	25	102		0	1,720		
Garage, Service Station		1	12	152	25	38		451	0		
Average		1	13	279	25	70		226	860	1,086	0.54
6 Manufacturing Plants	Factory	1	20	703	25	176			4,255	4,255	2.13
7 Laboratories	Medical Office, 1 Story	1	10	340	500	1,699	15,183			15,183	7.59
8 Schools & Colleges	School, Jr. High	2	12	1,905	400	7,619		90,514		90,514	45.26
9 Libraries & Museums	Library	2	14	852	50	426			7,215	7,215	3.61
10 Dormitories	Apartment, 1-3 Story	3	10	1,055	600	6,330	56,578			56,578	28.29
11 Hospital & Health Treatment	Medical Office, 2 Story	2	10	480	500	2,402	21,472			21,472	10.74
12 Public Buildings	Town Hall, 2-3 Story	3	12	944	600	5,662		67,266		67,266	33.63
13 Religious	Church	1	24	529	50	265			7,688	7,688	3.84
14 Amusement	Movie Theatre	1	20	445	30	133			3,230	3,230	1.61
15 Apartments/Assisted Living	Apartment, 1-3 Story	3	10	1,055	600	6,330	56,578			56,578	28.29
16 Misc.	Average	2	14	949	250	2,373			40,580	40,580	20.29

Stud properties	Weight LB/LF
350S125-30	0.65
350S125-33	0.72
350S162-33	0.88

Wall properties	Weight of Wall Section (LBS)	Unit Wt (LB/LF/FT HT)
350S125-30	57.20	0.89
50S125-33	63.36	0.99
350S162-33	77.44	1.21

Unit weight (1' high, 1' long) is based on calculations using a section 8' height, 10' long, 16" o.c.

1.25 = the weight amplification factor to account for door/window openings, bracing, waste etc. included in the above calculation.

Assumptions

- Means commercial construction examples are typical of Dodge classifications
- All interior walls are steel framed
- nterior wall percentages vs. exterior walls are assumed based on type of building.
- Three size studs are used to approximate tons of steel.
- LF of wall is used to determine amount of steel in example.
- 350S125-30 studs are used in walls mostly 12 feet high or less
- 350S125-33 studs are used for walls typically between 12 and 14 feet in height except for certain cases where thicker drywall studs are assumed.
- 350S162-33 studs are used for walls over 14 feet high

Floors

Tons of steel in each Dodge Classification based on 100% steel floors

	Dodge Segment	Means Class	Stories	Total SF	Footprint	Width	Length	Steel In Floor 800S200-43	1000S200-43	1000S200-54	Total (LBS)	Total (Tons)
1	Stores and Food Service	Restaurant, Fast Food	1	4,000	4,000	53	75	0			0	0.00
	Store, Convenience		1	4,000	4,000	53	75	0			0	0.00
	Average		1	4,000	4,000	53	75	0			0	0.00
2	Warehouses	Warehouse	1	30,000	30,000	145	206	0			0	0.00
3	Office and Bank Buildings	Office, 2-4 Story	3	20,000	6,667	69	97				0	0.00
		Bank	1	4,100	4,100	54	76	0			0	0.00
	Average		2	12,050	5,383	61	87		9,650		9,650	4.82
4	Hotels & Motels	Motel, 2-3 Story	3	49,000	16,333	107	152			72,425	72,425	36.21
5	Garages & Service Stations	Garage, Repair	1	10,000	10,000	84	119	0			0	0.00
		Garage, Service Station	1	1,400	1,400	31	45	0			0	0.00
	Average		1	5,700	5,700	58	82	0			0	0.00
6	Manufacturing Plants	Factory	1	30,000	30,000	145	206	0			0	0.00
7	Laboratories	Medical Office, 1 Story	1	7,000	7,000	70	100	0			0	0.00
8	Schools & Colleges	School, Jr. High	2	110,000	55,000	197	279			120,135	120,135	60.07
9	Libraries & Museums	Library	2	22,000	11,000	88	125		19,666		19,666	9.83
10	Dormitories	Apartment, 1-3 Story	3	22,500	7,500	73	103		27,040		27,040	13.52
11	Hospital & Health Treatment	Medical Office, 2 Story	2	7,000	3,500	50	70	5,575			5,575	2.79
12	Public Buildings	Town Hall, 2-3 Story	3	18,000	6,000	65	92		21,753		21,753	10.88
13	Religious	Church	1	17,000	17,000	110	155	0			0	0.00
14	Amusement	Movie Theatre	1	12,000	12,000	92	130	0			0	0.00
15	Apartments/Assisted Living	Apartment, 1-3 Story	3	22,500	7,500	73	103		27,040		27,040	13.52
16	Misc.	Average	2	24,583	13,657	98	139		19,455		19,455	9.73

Joist properties	Weight LB/LF
800S200-43	1.98
1000S200-43	2.29
1000S200-54	2.86

Assumptions

- Means commercial construction examples are typical of Dodge classifications
- All floor joists are steel framed
- Three joist sizes are used to approximate tons of steel.
- Width and length of building are used to determine amount of steel in each example.
- 800S200-43 joists are assumed in buildings with 50 foot widths or less
- 1000S200-43 joists are assumed for buildings with 50-100 foot widths.
- 1000S200-54 joists are assumed for buildings wider than 100 feet.

EXHIBIT A

Roofs

Tons of steel in each Dodge Classification based on 100% steel framed roofs

Dodge Segment	Means Class	Stories	Total SF	Footprint	Width	Length	Steel In Roof 400S162-33	400S162-43	600S162-54	Total (LBS)	Total (Tons)1
1 Stores and Food Service	Restaurant, Fast Food	1	4,000	4,000	53	75					
	Store, Convenience	1	4,000	4,000	53	75					
Average		1	4,000	4,000	53	75	6,562			6,562	3.28
2 Warehouses	Warehouse	1	30,000	30,000	145	206			97,325	97,325	48.66
3 Office and Bank Buildings	Office, 2-4 Story	3	20,000	6,667	69	97		13,995			
	Bank	1	4,100	4,100	54	76	6,724				
Average		2	12,050	5,383	61	87		10,360		10,360	5.18
4 Hotels & Motels	Motel, 2-3 Story	3	49,000	16,333	107	152			53,169	53,169	26.58
5 Garages & Service Stations	Garage, Repair	1	10,000	10,000	84	119		20,916			
	Garage, Service Station	1	1,400	1,400	31	45	2,338				
Average		1	5,700	5,700	58	82		11,627		11,627	5.81
6 Manufacturing Plants	Factory	1	30,000	30,000	145	206			97,325	97,325	48.66
7 Laboratories	Medical Office, 1 Story	1	7,000	7,000	70	100		14,688		14,688	7.34
8 Schools & Colleges	School, Jr. High	2	110,000	55,000	197	279			177,981	177,981	88.99
9 Libraries & Museums	Library	2	22,000	11,000	88	125		22,989		22,989	11.49
10 Dormitories	Apartment, 1-3 Story	3	22,500	7,500	73	103		15,727		15,727	7.86
11 Hospital & Health Treatment	Medical Office, 2 Story	2	7,000	3,500	50	70	5,752			5,752	2.88
12 Public Buildings	Town Hall, 2-3 Story	3	18,000	6,000	65	92		12,610		12,610	6.30
13 Religious	Church	1	17,000	17,000	110	155			55,325	55,325	27.66
14 Amusement	Movie Theatre	1	12,000	12,000	92	130		25,063		25,063	12.53
15 Apartments/Assisted Living	Apartment, 1-3 Story	3	22,500	7,500	73	103		15,727		15,727	7.86
16 Misc.	Average	2	24,583	13,657	98	139		28,497		28,497	14.25

Truss C-stud properties	Weight LB/LF
400S162-33	0.94
400S162-43	1.21
600S162-54	1.89

Truss Profiles	Weight/LF Truss
400S162-33	3.196
400S162-43	4.114
600S162-54	6.426

Assuming a 20 foot truss, 4:12 pitch

Assumptions

- Means commercial construction examples are typical of Dodge classifications
- All roofs are steel framed
- A standard 4:12 roof truss is assumed in all cases for simplicity
- Three size studs are used to approximate tons of steel.
- Width and length of building is used to determine amount of steel in example.
- 400S162-33 studs are used in buildings up to 60 feet wide
- 400S162-43 studs are used for buildings between 60 and 100 feet wide
- 600S162-54 studs are used for buildings over 100 feet wide.

EXHIBIT A

Tons of Steel in One Building for Each Dodge Classification

	Dodge Segment	Exterior Walls	Interior Walls	Floors	Roofs
1	Stores and Food Service	2.83	0.51	0.00	3.28
2	Warehouses	28.08	2.55	0.00	48.66
3	Office and Bank Buildings	11.01	18.28	4.82	5.18
4	Hotels & Motels	18.74	41.62	36.21	26.58
5	Garages & Service Stations	5.95	0.54	0.00	5.81
6	Manufacturing Plants	23.40	2.13	0.00	48.66
7	Laboratories	3.41	7.59	0.00	7.34
8	Schools & Colleges	30.57	45.26	60.07	88.99
9	Libraries & Museums	19.83	3.61	9.83	11.49
10	Dormitories	10.58	28.29	13.52	7.86
11	Hospital & Health Treatment	4.82	10.74	2.79	2.88
12	Public Buildings	15.15	33.63	10.88	6.30
13	Religious	21.14	3.84	0.00	27.66
14	Amusement	14.80	1.61	0.00	12.53
15	Apartments/Assisted Living	10.58	28.29	13.52	7.86
16	Misc.	22.31	20.29	9.73	14.25

Tons of Steel in Each Dodge Classification Using No. of Units From 2002 Data

	Dodge Segment	Exterior Walls	Interior Walls	Floors	Roofs	Totals
1	Stores and Food Service	179,171	31,925	0	207,406	418,501
2	Warehouses	183,264	16,666	0	317,635	517,565
3	Office and Bank Buildings	137,480	228,205	60,245	64,676	490,605
4	Hotels & Motels	15,070	33,461	29,115	21,374	99,020
5	Garages & Service Stations	163,725	14,942	0	160,034	338,702
6	Manufacturing Plants	40,695	3,701	0	84,640	129,037
7	Laboratories	7,821	17,418	0	16,850	42,089
8	Schools & Colleges	63,329	93,744	124,422	184,332	465,826
9	Libraries & Museums	11,613	2,112	5,757	6,730	26,213
10	Dormitories	10,853	29,007	13,863	8,063	61,786
11	Hospital & Health Treatment	66,492	148,094	38,449	39,670	292,706
12	Public Buildings	30,766	68,314	22,092	12,806	133,978
13	Religious	63,587	11,565	0	83,225	158,377
14	Amusement	86,384	9,427	0	73,153	168,964
15	Apartments/Assisted Living	185,350	495,385	236,757	137,701	1,055,193
16	Misc.	22,351	20,326	9,745	14,274	66,696
	Totals	1,267,953	1,224,291	540,445	1,432,569	4,465,258

EXHIBIT A

Market Share Factors
(Realistic Percentage of Buildings that used LGS in 2002)

	Dodge Segment	Exterior Walls	Interior Walls	Floors	Roofs	Totals
1	Stores and Food Service	45%	81%	0%	8%	29%
2	Warehouses	46%	81%	0%	0%	19%
3	Office and Bank Buildings	47%	81%	10%	8%	53%
4	Hotels & Motels	39%	81%	10%	8%	38%
5	Garages & Service Stations	45%	81%	0%	10%	30%
6	Manufacturing Plants	62%	81%	0%	0%	22%
7	Laboratories	50%	81%	0%	6%	45%
8	Schools & Colleges	39%	81%	10%	4%	26%
9	Libraries & Museums	50%	81%	0%	2%	29%
10	Dormitories	39%	81%	15%	6%	49%
11	Hospital & Health Treatment	44%	81%	10%	4%	53%
12	Public Buildings	49%	81%	0%	0%	53%
13	Religious	43%	81%	0%	0%	23%
14	Amusement	49%	81%	10%	0%	30%
15	Apartments/Assisted Living	50%	81%	18%	10%	52%
16	Misc.	49%	81%	10%	4%	43%
	Totals	47%	81%	13%	4%	38%

Market (2002) In Tons After Applying Factors

	Dodge Segment	Exterior Walls	Interior Walls	Floors	Roofs	Totals
1	Stores and Food Service	80,627	25,838	0	16,592	123,057
2	Warehouses	84,445	13,488	0	0	97,933
3	Office and Bank Buildings	64,616	184,693	6,024	5,174	260,507
4	Hotels & Motels	5,877	27,081	2,911	1,710	37,580
5	Garages & Service Stations	73,676	12,093	0	16,003	101,773
6	Manufacturing Plants	25,231	2,995	0	0	28,226
7	Laboratories	3,910	14,097	0	1,011	19,019
8	Schools & Colleges	24,698	75,870	12,442	7,373	120,383
9	Libraries & Museums	5,807	1,709	0	135	7,651
10	Dormitories	4,233	23,476	2,079	484	30,272
11	Hospital & Health Treatment	29,256	119,857	3,845	1,587	154,546
12	Public Buildings	15,076	55,288	0	0	70,364
13	Religious	27,343	9,360	0	0	36,703
14	Amusement	42,328	7,629	0	0	49,957
15	Apartments/Assisted Living	92,675	400,930	42,616	13,770	549,992
16	Misc.	10,952	16,450	974	571	28,948
	Totals	590,750	990,857	70,893	64,410	1,716,911

EXHIBIT A

Value of Steel Sheet Using Factored Ton Numbers Immediately Above

$23.5/CWT (AMM December 2002)

	Dodge Segment	Exterior Walls	Interior Walls	Floors	Roofs	Totals
1	Stores and Food Service	$ 37,894,589	$ 12,143,653	$ -	$ 7,798,463	$ 57,836,705
2	Warehouses	$ 39,689,266	$ 6,339,467	$ -	$ -	$ 46,028,732
3	Office and Bank Buildings	$ 30,369,371	$ 86,805,714	$ 2,831,504	$ 2,431,806	$ 122,438,396
4	Hotels & Motels	$ 2,762,319	$ 12,728,158	$ 1,368,390	$ 803,658	$ 17,662,526
5	Garages & Service Stations	$ 34,627,910	$ 5,683,719	$ -	$ 7,521,608	$ 47,833,237
6	Manufacturing Plants	$ 11,858,653	$ 1,407,734	$ -	$ -	$ 13,266,387
7	Laboratories	$ 1,837,836	$ 6,625,696	$ -	$ 475,182	$ 8,938,715
8	Schools & Colleges	$ 11,608,218	$ 35,658,742	$ 5,847,836	$ 3,465,434	$ 56,580,229
9	Libraries & Museums	$ 2,729,113	$ 803,449	$ -	$ 63,263	$ 3,595,826
10	Dormitories	$ 1,989,361	$ 11,033,797	$ 977,351	$ 227,375	$ 14,227,884
11	Hospital & Health Treatment	$ 13,750,554	$ 56,332,911	$ 1,807,121	$ 745,802	$ 72,636,388
12	Public Buildings	$ 7,085,521	$ 25,985,557	$ -	$ -	$ 33,071,078
13	Religious	$ 12,851,006	$ 4,399,220	$ -	$ -	$ 17,250,227
14	Amusement	$ 19,894,188	$ 3,585,820	$ -	$ -	$ 23,480,008
15	Apartments/Assisted Living	$ 43,557,305	$ 188,437,318	$ 20,029,670	$ 6,471,924	$ 258,496,218
16	Misc.	$ 5,147,493	$ 7,731,731	$ 458,002	$ 268,349	$ 13,605,575
	Totals	$ 277,652,705	$ 465,702,686	$ 33,319,875	$ 30,272,865	$ 806,948,130

EXHIBIT A

EXHIBIT A

Steel Framing Alliance

	Structural	Non-Structural	Total
Opportunity - 2002	3,240,967	1,224,291	4,465,258
SSMA Shipments - 2002	621,500	820,000	1,441,500
SSMA Estimated Share - 2002	75.0%	75.0%	75.0%
Industry Shipments - 2002	828,667	1,093,333	1,922,000
Residential Market - 2002	102,613	102,477	205,090
Nonresidential Market - 2002	726,053	990,857	1,716,910
Market - 2002 (from above)	726,054	990,857	1,716,911
Marketshare - 2002	22.40%	80.93%	38.45%

Nonresidential Steel Framing Market

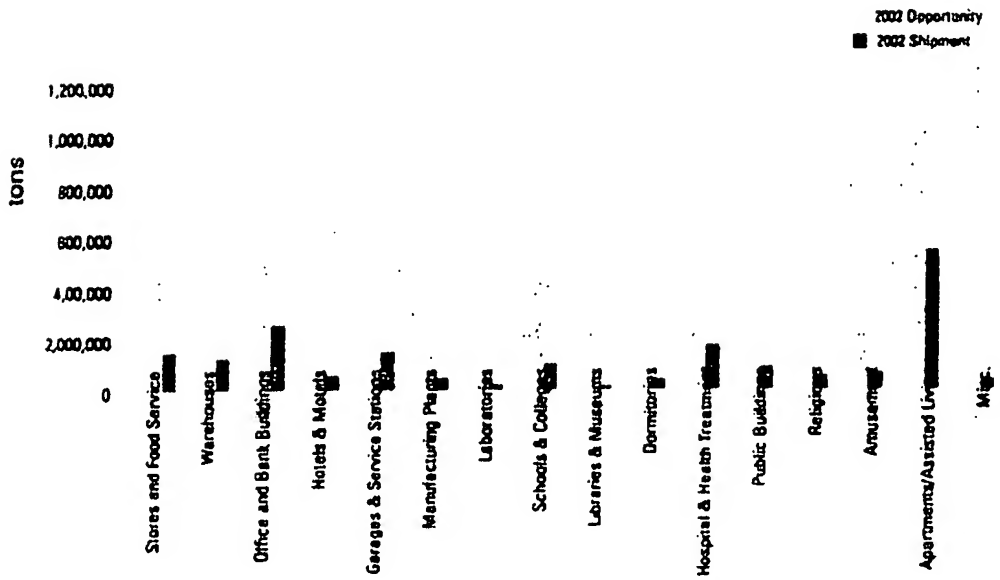


EXHIBIT B

Exhibit B

Market (2002) in Tons After Applying Factors

	Dodge Segment	Interior Walls (Tons)	Interior Walls (LBS)	LBS/Lin-Ft	Lin-Ft
1	Stores and Food Service	25,838	51,676,000	0.65	79,501,538
2	Warehouses	13,488	26,976,000	0.88	30,654,545
3	Office and Bank Buildings	184,693	369,386,000	0.88	419,756,818
4	Hotels & Motels	27,081	54,162,000	0.72	75,225,000
5	Garages & Service Stations	12,093	24,186,000	0.88	27,484,091
6	Manufacturing Plants	2,995	5,990,000	0.88	6,806,818
7	Laboratories	14,097	28,194,000	0.65	43,375,385
8	Schools & Colleges	75,870	151,740,000	0.72	210,750,000
9	Libraries & Museums	1,709	3,418,000	0.88	3,884,091
10	Dormitories	23,476	46,952,000	0.65	72,233,846
11	Hospital & Health Treatment	119,857	239,714,000	0.65	368,790,769
12	Public Buildings	55,288	110,576,000	0.72	153,577,778
13	Religious	9,360	18,720,000	0.88	21,272,727
14	Amusement	7,629	15,258,000	0.88	17,338,636
15	Apartments/Assisted Living	400,930	801,860,000	0.65	1,233,630,769
16	Misc.	16,450	32,900,000	0.88	37,386,364
	Totals	990,854	1,981,708,000		2,601,669,176

- Weights (lbs/lineal Ft) are from Page 9 of Exhibit A
- Conversion of Tons to lbs is based on 2000 lbs per ton

EXHIBIT C

Exhibit C

Derivations of Weight per Foot (interior wall)

These factors would be summarized in the following equation:

Width of Blank (inches) x Thickness of Blank (inches) x Length of Blank (inches) x Conversion Factor (lbs /Cubic inch) = lbs/lineal Ft

Existing Technology

Width of Blank =	6.5in
Thickness of Blank =	.015 in
Length =	12 in
Conversion Factor =	.283 lbs/cu in
	.331 lbs/lineal Ft

Proposed Patent Technology

Width of Blank =	4.1in
Thickness of Blank =	.015 in
Length =	12 in
Conversion Factor =	.283 lbs/cu in
	.209 lbs/lineal Ft

Material Savings – lbs/lineal Ft

.331 lb/lineal Ft - .209 lbs/lineal Ft = .122 lb/lineal Ft

% Material Savings

((.331-.209) .331) x100 = 37%

EXHIBIT D

EXHIBIT D

AMM Steel Base Prices

125 YEARS 1882 2007

STAINLESS STEELS

Market prices, f.o.b. mill, by grade, not including extra charges for size, finish, temper, packaging, shipping and other specifications.

COILED PLATE

Plate produced on a continuous mill.

Grade	$/cwt
304	220.01
304L	223.01
316	338.81
316L	341.61

UNCOILED PLATE

Plate produced on a plate mill.

Grade	$/cwt
304	283.91
304L	287.01
309	NA
310	NA
316L	428.91

BAR

Smooth-turned round bar, 1" diameter, mostly in 10,000-lb quantities.

Grade	$/cwt
303	262.63
304	283.20
316	376.21
416	137.58
17Cr4Ni	284.00

COLD-ROLLED SHEET

Grade	$/cwt
301	116.00
302	126.00
304	228.01
304L	231.01
316L	352.61

COLD-ROLLED STRIP

Grade	$/cwt
304L	248.01
316L	363.01

NA—Not available

TOOL STEELS

Estimated market prices per lb, f.o.b. mill or warehouse. Most prices were effective 08/23/07

COLD WORK DIE STEELS

(decarb free)

Grade	Shape	Size	Price
A-2	Flat	1/2"x1"	$3.50-$4.00
A-2	Flat	3"x4"	$3.25
D-2	Round	20"	$3.20

HOT WORK DIE STEELS

(decarb free)

Grade	Price
H-14 (2" Round)	NA
H-13, 2-inch rounds	$3.00
D-2 flat bar	$3.75
H-13 round bar	NA

SHEETS

Market prices per hundredweight, f.o.b. mill, for hot-rolled and cold-rolled sheets.

HOT-ROLLED SHEET

Midwest $26.50

COLD-ROLLED (Class I)

Midwest $31.50

HOT-DIPPED GALVANIZED SHEET

Midwest $39.00

GALVALUME SHEET

Midwest $43.00

ELECTROGALVANIZED SHEET

Midwest $41.00

ALUMINIZED SHEET

Midwest

Type 1 $44.50

MOTOR LAMINATION SHEET

Midwest $31.50

TIN

Single-reduced, per base box; Mill list prices,(rev. 01/04/07)

Electrolytic .25 lb $85.46

BARS

Market prices per hundredweight, f. o. b. mill.

MERCHANT PRODUCTS

(base prices)

Reinforcing bar, Grade 60, No. 5	$29.00
2 x 2 x 1/4" angle	$33.35
3x3x1/4-inch angles	$33.80
8x11.5 channels	$37.15
1/2 x 4" flat	$33.55

COLD-FINISHED

1" round, 1018 (carbon)	$48.50
1" round, 12L14 (carbon)	$49.00
1" round, 4140 (alloy)	$73.00

HOT-ROLLED

(special bar quality)

1" round, 1000 series (carbon)	$35.00
1" round, 4100 series (alloy)	$48.50

ROD

Market prices per hundredweight, delivered.

Mesh quality low carbon	$28.00
Industrial quality low carbon	$30.00
High carbon	$31.50
Cold-heading quality	$33.00

PLATE

Market prices per hundredweight, f.o.b. mill.

CARBON GRADE PLATE

National mills	
Cut-to-length	$38.00-$41.00
Coiled	$38.00-$41.00

STRIP MILL PLATE

48-inches	$26.50
60-inches	$26.50
72-inches	$26.50

ALLOY PLATE

National mills $68.00-$85.00

SAFETY PLATE

(also known as floor plate)

National mills $53.00

NA—Not available

IMPORT PRICES

Port of Houston prices, f.o.b. mill, in $/short ton.

Slab	$500
Rebar	$540-$560
Wire Rod (low carbon)	$600
Merchant Bar	$620-$630
Medium Sections	$600-$620
Heavy Sections (over 24 inches)	$750-$760
HR Coil (commodity)	$520
Heavy Plate	$640-$660
Medium Plate	$720-$740
CR Coil	$600
US Mill fob (Midwest)	
HR coil	$520-$530
CR coil	$620
Hot-Dip Galvanized coil	$780

OIL COUNTRY TUBULAR GOODS

Average monthly market prices per ton from distributors surveyed in the Houston area by Pipe Logix, Inc.

	Aug. $/ton	July $/ton	Percent Change
TUBING			
Carbon—annealed ERW	$1,272	$1,287	-1.2
Carbon—seamless	$1,460	$1,483	-0.2
N80- ERW	$1,658	$1,646	0.8
N80- seamless	$1,799	$1,791	0.4
CASING			
Carbon—annealed ERW	$1,079	$1,094	-1.3
Carbon—seamless	$1,238	$1,270	-2.5
N80- ERW	$1,436	$1,436	-0.7
N80- seamless	$1,506	$1,551	-2.9

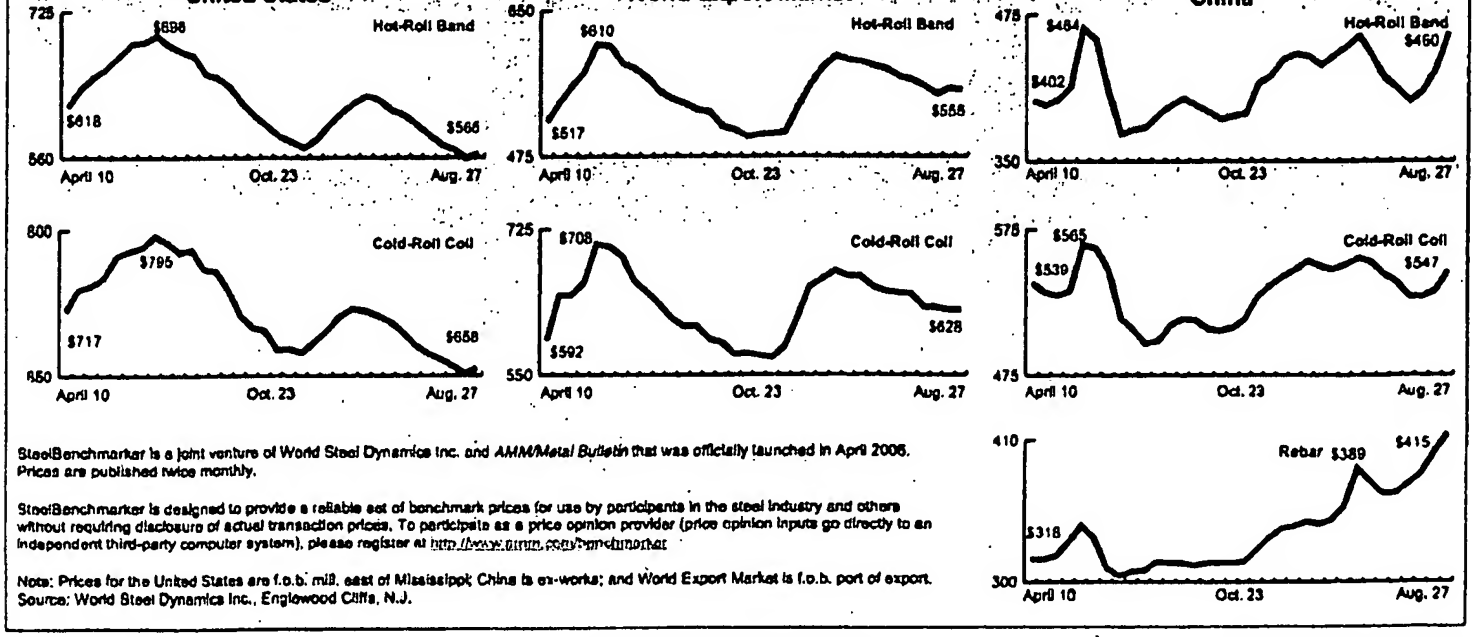
Prices are subject to the Disclaimer appearing on the "*AMM* Scrap Iron & Steel Prices" page.

Notice

The rapid increase in zinc prices has created some confusion in the market related to hot-dip galvanized sheet pricing, prompting *AMM* to modify its reporting of this price. The *AMM* price for hot-dip galvanized sheet represents a base price plus a G90 coating on material 0.040 inch (1 millimeter) thick.

SteelBenchmarker Pricing

(dollars per tonne)



SteelBenchmarker is a joint venture of World Steel Dynamics Inc. and *AMM/Metal Bulletin* that was officially launched in April 2006. Prices are published twice monthly.

SteelBenchmarker is designed to provide a reliable set of benchmark prices for use by participants in the steel industry and others without requiring disclosure of actual transaction prices. To participate as a price opinion provider (price opinion inputs go directly to an independent third-party computer system), please register at http://www.amm.com/bm-chimonthly

Note: Prices for the United States are f.o.b. mill, east of Mississippi; China is ex-works; and World Export Market is f.o.b. port of export.
Source: World Steel Dynamics Inc., Englewood Cliffs, N.J.

EXHIBIT E

Exhibit E

Derivation of Material Savings

These factors would be summarized in the following equation:

Weight of material required to manufacture 1 foot-

Existing framing member	0.331 lb/lineal-foot
Proposed patent design	0.209 lb/lineal-foot
Anticipated weight saving	0.122 lb/lineal-foot
Current price of Hot Dipped Galvanized Sheet	$0.39 per pound
Anticipated saving per lineal foot	.0475 per foot
Estimated market for this product	2,800,000,000 feet/year
Estimated market value	$133,000,000 / year